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EXAMINER	
THOMPSON, JAMES A	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/730,561	Applicant(s) SUZUKI ET AL.	
	Examiner James A. Thompson	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2005 and 25 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-10,12-18,20-26,28,29,31-43,45,46,48-53,55,56,58-63,65,66 and 68-71* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/324,507.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 25, lines 9-11, filed 13 January 2005, with respect to the objection to claim 27 have been fully considered and are persuasive. The objection to claim 27 listed in item 2 of the previous office action, dated 07 July 2004, has been withdrawn.

2. Applicant's arguments, see page 25, lines 12-18, filed 13 January 2005, with respect to the rejections under 35 USC §112, 1st paragraph have been fully considered and are persuasive. The rejections under 35 USC §112, 1st paragraph listed in items 3-6 of said previous office action have been withdrawn.

3. Applicant's arguments, see page 25, line 19 to page 26, line 6, filed 13 January 2005, with respect to the rejections under 35 USC §112, 2nd paragraph have been fully considered and are persuasive. The rejections under 35 USC §112, 2nd paragraph listed in items 7-11 of said previous office action have been withdrawn.

4. Applicant's arguments filed 13 January 2005 have been fully considered but they are not persuasive.

Despite the length of Applicant's arguments, Applicant has not even attempted to substantively address the prior art rejections given in detail in the previous office action, dated 22 July 2004. Applicant has merely discussed the newly amended claims, given a non-specific summary of Applicant's personal opinion regarding the prior art cited by Examiner in said

previous office action, and then *merely alleged* that a few particular limitations are not found in the prior art of record. Therefore, Applicant is clearly being unresponsive to the prior art rejections listed in said previous office action.

Further, Examiner respectfully submits that Tajima (US Patent 5,572,600), Kolpatzik (US Patent 5,745,660), Parker (US Patent 5,543,941), and Shimazaki (US Patent 5,832,122) disclose considerably more than Applicant claims that the references are "merely seen to disclose". Both a reading of said previous office action, which includes cited portions of the prior art references cited therein, and a simple reading of said prior art references clearly demonstrates that said prior art references disclose considerably more than Applicant has described in Applicant's arguments.

5. Applicant's arguments filed 25 May 2005 have been fully considered but they are not persuasive. The present claims, including any amendments, have been fully considered. The rejections of the present claims are given in detail below.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 16, 20-21, 23 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Tajima (US Patent 5,572,600).

Regarding claims 16 and 38: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 23(104) of Tajima) for storing the mask (column 15, lines 7-12 of Tajima); comparison means (figure 2(5) of Tajima) for comparing each value of the mask with a density of each pixel of the input image (column 5, lines 14-19 of Tajima); and output means (figure 2(output of 5) of Tajima) for outputting a binary or multivalue dot pattern based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), wherein the mask provides a plurality of isolated spectra for a two-dimensional spatial frequency spectrum (column 6, lines 26-34 of Tajima) of a dot pattern generated by a single mask (figure 6 and column 6, lines 6-11 of Tajima). Each isolated spectra of the two-dimensional spatial frequency spectrum is located in μ-ν space at points corresponding to m and n equal to integers (column 6, lines 26-28 of Tajima) based on a conversion equation (column 6, equation 5 of Tajima). The equation is used in determining the screen angle for ideal moiré conditions of a mask (column 6, lines 11 of Tajima). Since halftoning is performed for multivalued image data (column 5, lines 14-19 of Tajima), said plurality of isolated spectra are provided at each respective gray level.

Tajima further discloses that the binary or multivalue dot pattern is generated, in an output image such that no moiré and/ or certain repetitive pattern is generated when the input image undergoes the gray level reproducing process (column 9, lines 48-54 of Tajima) and the image is output by an output device (column 10, lines 5-8 of Tajima).

Further regarding claim 16: The apparatus of claim 38 performs the method of claim 16.

Regarding claim 20: Tajima discloses that adjacent masks (figure 3(502M) of Tajima) are shifted along boundaries when said mask is repeatedly used and arranged two-dimensionally (figure 3 and column 5, lines 51-58 of Tajima).

Regarding claim 21: Tajima discloses a mask (halftone screen) (figure 3(502M) and column 8, lines 38-42 of Tajima) which is clearly not a quadrilateral.

Regarding claim 23: Tajima discloses that the input image is a color image that is separated into a plurality of color components (column 4, lines 64-67 of Tajima); and at least one of the color components of the color image is used as the input image (column 5, lines 10-14 of Tajima).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 9, 12-13, 15, 37, 45, 55 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660).

Regarding claims 9 and 45: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 2(6M) of Tajima) for storing the threshold matrix (column 5, lines 30-34 of Tajima); and comparison means (figure 2(5) of Tajima) for comparing each value of the threshold matrix with density of

each pixel of the input image (column 5, lines 14-19 of Tajima). A binary or multivalue dot pattern is output (column 5, lines 18-19 of Tajima) based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), therefore an output means must be included in the apparatus.

Said threshold matrix produces, by itself, a dot pattern having halftone screen (meshing) properties at each respective gray level (column 12, lines 54-59 of Tajima). Using the mask over the entire pixel block generates a smooth gradation (column 12, lines 54-59 of Tajima) and reduces moiré (column 9, lines 48-54 of Tajima). Said threshold matrix generates an output image with no moiré and/or certain repetitive pattern when the input image undergoes the gray level reproducing process (column 9, lines 48-54 of Tajima) and the image is output by an output device (column 10, lines 5-8 of Tajima). Said apparatus reduces moiré (column 9, lines 48-54 of Tajima) and outputs the threshold values in synchronism with the multi-valued image data (column 10, lines 5-8 of Tajima), which would thus produce the output image.

Tajima does not disclose expressly that said properties that are provided are non-blue noise properties.

Kolpatzik discloses providing stochastic properties to the threshold matrix (array) values (column 6, lines 35-37 of Kolpatzik). The stochastic properties of the stochastic threshold matrix are designed based on trade-offs between grain and mottle of the resultant image (column 6, lines 58-62 of Kolpatzik), and therefore not blue noise properties.

Tajima and Kolpatzik are combinable because they are from the same field of endeavor, namely halftone screen generation. At the time of the invention, it would have been obvious to a

person of ordinary skill in the art to add the stochastic screen properties taught by Kolpatzik to the halftone screen taught by Tajima. The motivation for doing so would have been to prevent image artifacts (column 7, lines 40-41 of Kolpatzik). Therefore, it would have been obvious to combine Kolpatzik with Tajima to obtain the invention as specified in claims 9 and 45.

Further regarding claim 9: The apparatus of claim 45 performs the method of claim 9.

Regarding claim 37: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 23(104) of Tajima) for storing the mask (column 15, lines 7-12 of Tajima); comparison means (figure 2(5) of Tajima) for comparing each value of the mask with a density of each pixel of the input image (column 5, lines 14-19 of Tajima); and output means (figure 2(output of 5) of Tajima) for outputting a binary or multivalue dot pattern based on comparison results of said comparison means (column 5, lines 14-19 of Tajima). A binary or multivalue dot pattern is output (column 5, lines 18-19 of Tajima) based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), therefore an output means must be included in the apparatus.

Tajima further discloses that said mask provides a dot pattern having halftone screen (meshing) properties at each respective gray level (column 12, lines 54-59 of Tajima). Using the mask over the entire pixel block generates a smooth gradation (column 12, lines 54-59 of Tajima) and reduces moiré (column 9, lines 48-54 of Tajima). The binary or multivalue dot pattern is generated, in an output image such that no moiré and/ or certain repetitive pattern is generated when the input image undergoes a gray level reproducing process (column 9, lines 48-

54 of Tajima) and the image is output by an output device (column 10, lines 5-8 of Tajima).

Tajima does not disclose expressly that said properties that are provided are non-blue noise properties.

Kolpatzik discloses providing stochastic properties to the threshold matrix (array) values (column 6, lines 35-37 of Kolpatzik). The stochastic properties of the stochastic threshold matrix are designed based on trade-offs between grain and mottle of the resultant image (column 6, lines 58-62 of Kolpatzik), and therefore not blue noise properties.

Tajima and Kolpatzik are combinable because they are from the same field of endeavor, namely halftone screen generation. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add the stochastic screen properties taught by Kolpatzik to the mask taught by Tajima. The motivation for doing so would have been to prevent image artifacts (column 7, lines 40-41 of Kolpatzik). Therefore, it would have been obvious to combine Kolpatzik with Tajima to obtain the invention as specified in claim 37.

Regarding claim 55: The threshold matrix of claim 55 is embodied in the apparatus of claim 45, the arguments of which are incorporated herein.

Regarding claim 65: Tajima discloses an apparatus (figure 2 of Tajima) comprising a module for comparing (figure 2(5) of Tajima) each value of the threshold matrix with the density of each pixel of the input image (column 5, lines 14-18 of Tajima), and for controlling an output of each binary or multivalue dot pattern depending on the comparison results (column 5, lines 18-19 of Tajima), wherein the threshold matrix produces, by itself, a dot pattern, as disclosed in claim 55, the arguments of which

are incorporated herein. Digital memory (figure 2(3M,3C,3Y,6M, 6C,6Y) of Tajima) and a digital control circuit (figure 2(4) of Tajima) controls digital image data processing (column 4, lines 61-64 and column 5, lines 10-19 of Tajima). The apparatus is therefore a form of computer. Since digital data is compared with threshold values (column 5, lines 14-19 of Tajima) and various digital processing is performed (column 6, lines 10-26 of Tajima), some form of software is required.

Regarding claim 12: Tajima discloses that adjacent masks (figure 3(502M) of Tajima) are shifted along boundaries when said mask is repeatedly used and arranged two-dimensionally (figure 3 and column 5, lines 51-58 of Tajima).

Regarding claim 13: Tajima discloses a mask (halftone screen) (figure 3(502M) and column 8, lines 38-42 of Tajima) which is clearly not a quadrilateral.

Regarding claim 15: Tajima discloses that the input image is a color image that is separated into a plurality of color components (column 4, lines 64-67 of Tajima); and at least one of the color components of the color image is used as the input image (column 5, lines 10-14 of Tajima).

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660) and Barton (US Patent 5,526,438).

Regarding claim 14: Tajima in view of Kolpatzik does not disclose expressly that, as a process of determining a dot distribution at each respective gray level for producing said mask, a repulsive potential is assigned to all dots constructing a determined dot pattern of a specific gray level and a new dot

to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential within the sum of said repulsive potentials.

Barton discloses a repulsive potential (FnC) that is assigned to all dots constructing a determined dot pattern of a specific gray level (column 8, lines 45-51 of Barton) and a new dot to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential within the sum of said repulsive potentials (column 8, lines 50-55 of Barton). For a new dot about to be placed, a cost function (FnC) is determined (column 8, lines 45-51 of Barton). Said cost function is a function of radial distance (column 8, lines 48-50 and lines 64-66 of Barton) relating candidate pixels to other dots (column 8, lines 51-54 of Barton), so said cost function is a potential function.

Tajima in view of Kolpatzik is combinable with Barton because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the repulsive potential formulation of Barton to determine the dot locations for the threshold masks. The motivation for doing so would have been to maximize dispersion and minimize visual artifacts (column 2, lines 50-53 of Barton). Therefore, it would have been obvious to combine Barton with Tajima in view of Kolpatzik to obtain the invention as specified in claim 14.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Rylander (US Patent 5,583,660).

Regarding claim 18: Tajima does not disclose expressly that said output device has a resolution of 600 dpi or greater.

Rylander discloses an output device that has a resolution of 600 dpi or greater (column 12, lines 61-63 of Rylander).

Tajima and Rylander are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a high resolution output device, as taught by Rylander, to output the image data. The motivation for doing so would have been to output image data produced using a particular fixed pattern (column 12, lines 57-60 of Rylander). Therefore, it would have been obvious to combine Rylander with Tajima to obtain the invention as specified in claim 18.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Barton (US Patent 5,526,438).

Regarding claim 22: Tajima does not disclose expressly that, as a process of determining a dot distribution at each respective gray level for producing said mask, a repulsive potential is assigned to all dots constructing a determined dot pattern of a specific gray level and a new dot to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential in/within the sum of said repulsive potentials.

Barton discloses a repulsive potential (FnC) that is assigned to all dots constructing a determined dot pattern of a specific gray level (column 8, lines 45-51 of Barton) and a new dot to determine a dot distribution for a next gray level is

placed at a position having the lowest repulsive potential in/within the sum of said repulsive potentials (column 8, lines 50-55 of Barton). For a new dot about to be placed, a cost function (FnC) is determined (column 8, lines 45-51 of Barton). Said cost function is a function of radial distance (column 8, lines 48-50 and lines 64-66 of Barton) relating candidate pixels to other dots (column 8, lines 51-54 of Barton), so said cost function is a potential function.

Tajima and Barton are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the repulsive potential formulation of Barton to determine the dot locations for the threshold masks. The motivation for doing so would have been to maximize dispersion and minimize visual artifacts (column 2, lines 50-53 of Barton). Therefore, it would have been obvious to combine Barton with Tajima to obtain the invention as specified in claim 22.

13. Claims 10, 46, 56 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660) and Rylander (US Patent 5,583,660).

Regarding claims 10, 46, 56 and 66: Tajima in view of Kolpatzik does not disclose expressly that said output device has a resolution of 600 dpi or greater.

Rylander discloses an output device that has a resolution of 600 dpi or greater (column 12, lines 61-63 of Rylander).

Tajima in view of Kolpatzik is combinable with Rylander because they are from the same field of endeavor, namely

halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a high resolution output device, as taught by Rylander, to output the image data. The motivation for doing so would have been to output image data produced using a particular fixed pattern (column 12, lines 57-60 of Rylander). Therefore, it would have been obvious to combine Rylander with Tajima in view of Kolpatzik to obtain the invention as specified in claims 10, 46, 56 and 66.

14. Claims 1, 5-6, 8, 36, 42, 52, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660) and Parker (US Patent 5,543,941).

Regarding claims 1 and 42: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 2(6M) of Tajima) for storing the threshold matrix (column 5, lines 30-34 of Tajima); comparison means (figure 2(5) of Tajima) for comparing each value of the threshold matrix with density of each pixel of the input image (column 5, lines 14-19 of Tajima). A binary or multivalue dot pattern is output (column 5, lines 18-19 of Tajima) based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), therefore an output means must be included in the apparatus.

Said threshold matrix has a size corresponding to a size smaller than the pixel block (figure 3(501M) of Tajima) (figure 3 and column 5, lines 46-51 of Tajima), a dot pattern generated in the pixel block has halftone screen (meshing) properties (smooth gradation generation) at each respective gray level (column 12, lines 54-59 of Tajima), and no moiré and/or certain

repetitive patterns are not generated in the output image when the input image undergoes the gray level reproducing process (column 9, lines 48-54 of Tajima) and the produced image is output by an output device (column 10, lines 5-8 of Tajima).

Tajima does not disclose expressly that said properties that are provided are non-blue noise properties; and that said pixel block is of the standard size.

Kolpatzik discloses providing stochastic properties to the threshold matrix (array) values (column 6, lines 35-37 of Kolpatzik). The stochastic properties of the stochastic threshold matrix are designed based on trade-offs between grain and mottle of the resultant image (column 6, lines 58-62 of Kolpatzik), and therefore not blue noise properties.

Tajima and Kolpatzik are combinable because they are from the same field of endeavor, namely halftone screen generation. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add the stochastic screen properties taught by Kolpatzik to the halftone screen taught by Tajima. The motivation for doing so would have been to prevent image artifacts (column 7, lines 40-41 of Kolpatzik). Therefore, it would have been obvious to combine Kolpatzik with Tajima.

Tajima in view of Kolpatzik does not disclose expressly that said pixel block is of the standard size.

Parker discloses applying a mask (figure 5(502) of Parker) to a pixel block (figure 5(500) of Parker) of the standard size (256x256 pixels) (column 8, lines 19-24 of Parker).

Tajima in view of Kolpatzik is combinable with Parker because they are from the same field of endeavor, namely image processing and halftoning. At the time of the invention, it

would have been obvious to a person of ordinary skill in the art to use a standard size pixel block for the image data. The motivation for doing so would have been to represent 256 levels of varying distribution (column 13, lines 10-12 of Tajima) of black and white pixels on a grid (column 8, lines 15-18 of Parker). Therefore, it would have been obvious to combine Parker with Tajima in view of Kolpatzik to obtain the invention as specified in claims 1 and 42.

Further regarding claim 1: The apparatus of claim 42 performs the method of claim 1.

Regarding claim 36: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 23(104) of Tajima) for storing the mask (column 15, lines 7-12 of Tajima); comparison means (figure 2(5) of Tajima) for comparing each value of the mask with a density of each pixel of the input image (column 5, lines 14-19 of Tajima); and output means (figure 2(output of 5) of Tajima) for outputting a binary or multivalue dot pattern based on comparison results of said comparison means (column 5, lines 14-19 of Tajima). A binary or multivalue dot pattern is output (column 5, lines 18-19 of Tajima) based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), therefore an output means must be included in the apparatus.

Tajima further discloses that said mask provides a dot pattern having halftone screen (meshing) properties at each respective gray level (column 12, lines 54-59 of Tajima). Using the mask over the entire pixel block generates a smooth gradation (column 12, lines 54-59 of Tajima) and reduces moiré (column 9, lines 48-54 of Tajima). The binary or multivalue dot pattern is generated, in an output image such that no moiré and/

or certain repetitive pattern is generated when the input image undergoes a gray level reproducing process (column 9, lines 48-54 of Tajima) and the image is output by an output device (column 10, lines 5-8 of Tajima).

Tajima does not disclose expressly that said properties that are provided are non-blue noise properties; and that said pixel block is of the standard size.

Kolpatzik discloses providing stochastic properties to the threshold matrix (array) values (column 6, lines 35-37 of Kolpatzik). The stochastic properties of the stochastic threshold matrix are designed based on trade-offs between grain and mottle of the resultant image (column 6, lines 58-62 of Kolpatzik), and therefore not blue noise properties.

Tajima and Kolpatzik are combinable because they are from the same field of endeavor, namely halftone screen generation. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add the stochastic screen properties taught by Kolpatzik to the halftone screen taught by Tajima. The motivation for doing so would have been to prevent image artifacts (column 7, lines 40-41 of Kolpatzik). Therefore, it would have been obvious to combine Kolpatzik with Tajima.

Tajima in view of Kolpatzik does not disclose expressly that said pixel block is of the standard size.

Parker discloses applying a mask (figure 5(502) of Parker) to a pixel block (figure 5(500) of Parker) of the standard size (256x256 pixels) (column 8, lines 19-24 of Parker).

Tajima in view of Kolpatzik is combinable with Parker because they are from the same field of endeavor, namely image processing and halftoning. At the time of the invention, it

would have been obvious to a person of ordinary skill in the art to use a standard size pixel block for the image data. The motivation for doing so would have been to represent 256 levels of varying distribution (column 13, lines 10-12 of Tajima) of black and white pixels on a grid (column 8, lines 15-18 of Parker). Therefore, it would have been obvious to combine Parker with Tajima in view of Kolpatzik to obtain the invention as specified in claim 36.

Regarding claim 52: The threshold matrix of claim 52 is embodied in the apparatus of claim 42, the arguments of which are incorporated herein.

Regarding claim 62: Tajima discloses an apparatus (figure 2 of Tajima) comprising a module for comparing (figure 2(5) of Tajima) each value of the threshold matrix with the density of each pixel of the input image (column 5, lines 14-18 of Tajima), and for controlling an output of each binary or multivalue dot pattern depending on the comparison results (column 5, lines 18-19 of Tajima), wherein a threshold matrix produces a dot pattern, as disclosed in claim 52, the arguments of which are incorporated herein. Digital memory (figure 2(3M,3C,3Y,6M,6C, 6Y) of Tajima) and a digital control circuit (figure 2(4) of Tajima) that controls digital image data processing (column 4, lines 61-64 and column 5, lines 10-19 of Tajima). The apparatus is therefore a form of computer. Since digital data is compared with threshold values (column 5, lines 14-19 of Tajima) and various digital processing is performed (column 6, lines 10-26 of Tajima), some form of software is required.

Regarding claim 5: Tajima discloses that adjacent masks (figure 3(502M) of Tajima) are shifted along boundaries when

said mask is repeatedly used and arranged two-dimensionally (figure 3 and column 5, lines 51-58 of Tajima).

Regarding claim 6: Tajima discloses a mask (halftone screen) (figure 3(502M) and column 8, lines 38-42 of Tajima) which is clearly not a quadrilateral.

Regarding claim 8: Tajima discloses that the input image is a color image that is separated into a plurality of color components (column 4, lines 64-67 of Tajima); and at least one of the color components of the color image is used as the input image (column 5, lines 10-14 of Tajima).

15. Claims 2, 43, 53 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660), Parker (US Patent 5,543,941) and Rylander (US Patent 5,583,660).

Regarding claims 2, 43, 53 and 63: Tajima in view of Kolpatzik and Parker does not disclose expressly that said output device has a resolution of 600 dpi or greater.

Rylander discloses an output device that has a resolution of 600 dpi or greater (column 12, lines 61-63 of Rylander).

Tajima in view of Kolpatzik and Parker is combinable with Rylander because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a high resolution output device, as taught by Rylander, to output the image data. The motivation for doing so would have been to output image data produced using a particular fixed pattern (column 12, lines 57-60 of Rylander). Therefore, it would have been obvious to combine Rylander with Tajima in

view of Kolpatzik and Parker to obtain the invention as specified in claims 2, 43, 53 and 63.

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660), Parker (US Patent 5,543,941) and Shimazaki (US Patent 5,832,122).

Regarding claim 4: Tajima in view of Kolpatzik and Parker does not disclose expressly that said dot pattern generated by the mask has a value equal to or greater than 0.6 dB as an average value of anisotropy at each respective gray level.

Shimazaki discloses that the threshold matrices are designed such that thresholds having close values are not positioned closely to each other, thus preventing undue localization (figures 5-7 and column 6, lines 18-21 of Shimazaki). Further, the threshold values are partially randomized (column 5, lines 54-60 of Shimazaki). The threshold values are therefore ordered in a scattered format throughout the threshold matrix, such as can be seen in figures 5-7 of Shimazaki. Since anisotropy is a measure of the sample variance over the radially averaged power spectrum, and there is a large variance in the dot pattern designed to minimize the degree of granularity (column 6, lines 21-25 of Shimazaki), the average value of anisotropy at each respective gray level for the dot pattern is greater than 0.6 dB.

Tajima in view of Kolpatzik and Parker is combinable with Shimazaki because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the pattern of threshold matrix values taught by

Shimazaki in the threshold matrices of Tajima. The motivation for doing so would have been to produce a higher quality halftone image, free of a regular pattern (column 6, lines 26-28 of Shimazaki). Therefore, it would have been obvious to combine Shimazaki with Tajima in view of Kolpatzik and Parker to obtain the invention as specified in claim 4.

17. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Kolpatzik (US Patent 5,745,660), Parker (US Patent 5,543,941) and Barton (US Patent 5,526,438).

Regarding claim 7: Tajima in view of Kolpatzik and Parker does not disclose expressly that, as a process of determining a dot distribution at each respective gray level for producing said mask, a repulsive potential is assigned to all dots constructing a determined dot pattern of a specific gray level and a new dot to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential within the sum of said repulsive potentials.

Barton discloses a repulsive potential (FnC) that is assigned to all dots constructing a determined dot pattern of a specific gray level (column 8, lines 45-51 of Barton) and a new dot to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential within the sum of said repulsive potentials (column 8, lines 50-55 of Barton). For a new dot about to be placed, a cost function (FnC) is determined (column 8, lines 45-51 of Barton). Said cost function is a function of radial distance (column 8, lines 48-50 and lines 64-66 of Barton) relating candidate pixels

to other dots (column 8, lines 51-54 of Barton), so said cost function is a potential function.

Tajima in view of Kolpatzik and Parker is combinable with Barton because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the repulsive potential formulation of Barton to determine the dot locations for the threshold masks. The motivation for doing so would have been to maximize dispersion and minimize visual artifacts (column 2, lines 50-53 of Barton). Therefore, it would have been obvious to combine Barton with Tajima in view of Kolpatzik and Parker to obtain the invention as specified in claim 7.

18. Claims 17, 48, 58 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Parker (US Patent 5,543,941).

Regarding claim 48: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 2(6M) of Tajima) for storing the threshold matrix (column 5, lines 30-34 of Tajima); comparison means (figure 2(5) of Tajima) for comparing each value of the threshold matrix with density of each pixel of the input image (column 5, lines 14-19 of Tajima). A binary or multivalue dot pattern is output (column 5, lines 18-19 of Tajima) based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), therefore an output means must be included in the apparatus.

Tajima further discloses that said threshold matrix produces, by itself, a dot pattern having a plurality of isolated spectra in a two-dimensional spatial frequency spectrum

(column 6, lines 26-34 of Tajima).Each isolated spectra of the two-dimensional spatial frequency spectrum is located in μ-ν space at points corresponding to m and n equal to integers (column 6, lines 26-28 of Tajima) based on a conversion equation (column 6, equation 5 of Tajima). Since halftoning is performed for multivalued image data (column 5, lines 14-19 of Tajima), said plurality of isolated spectra are provided at each respective gray level.

Tajima does not disclose expressly that said threshold matrix assigns a noise component having small low frequency components to a one-dimensional power spectrum of a dot distribution at a plurality of gray levels.

Parker discloses a halftone mask (figure 4(406) of Parker) that assigns a noise component having small low frequency components to a one-dimensional power spectrum (figure 1 and column 6, lines 51-53 of Parker) of a dot distribution at a plurality of gray levels (column 9, lines 31-37 of Parker). The filter is circularly symmetric (column 9, lines 35-36 of Parker). As can be seen from figure 1 of Parker, there are small low frequency components before the substantial rise in component values up to frequency f_g, and an absence below a certain frequency value (column 9, lines 7-12 of Parker).

Tajima and Parker are combinable because they are from the same field of endeavor, namely image processing and halftoning. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include noise components with small low frequency components, as taught by Parker, in the halftone threshold matrix taught by Tajima. The motivation for doing so would have been to eliminate disturbing artifacts in the spatial domain (column 9, lines 9-12 of Parker). Therefore,

it would have been obvious to combine Parker with Tajima to obtain the invention as specified in claim 48.

Regarding claim 58: The threshold matrix of claim 58 is embodied in the apparatus of claim 48, the arguments of which are incorporated herein.

Regarding claim 68: Tajima discloses an apparatus (figure 2 of Tajima) comprising a module for comparing (figure 2(5) of Tajima) each value of the threshold matrix with the density of each pixel of the input image (column 5, lines 14-18 of Tajima), and for controlling an output of each binary or multivalue dot pattern depending on the comparison results (column 5, lines 18-19 of Tajima), wherein the threshold matrix produces, by itself, a dot pattern, as disclosed in claim 58, the arguments of which are incorporated herein. Digital memory (figure 2(3M,3C,3Y,6M,6C,6Y) of Tajima) and a digital control circuit (figure 2(4) of Tajima) controls digital image data processing (column 4, lines 61-64 and column 5, lines 10-19 of Tajima). The apparatus is therefore a form of computer. Since digital data is compared with threshold values (column 5, lines 14-19 of Tajima) and various digital processing is performed (column 6, lines 10-26 of Tajima), some form of software is required.

Regarding claim 17: Tajima does not disclose expressly that each dot pattern generated by said mask has a noise component having small low frequency components of a one-dimensional power spectrum due to weak irregularity (perturbation) or pseudo-periodicity introduced at a plurality of gray levels.

Parker discloses a halftone mask (figure 4(406) of Parker) that assigns a noise component having small low frequency components to a one-dimensional power spectrum (figure 1 and

column 6, lines 51-53 of Parker) of a dot distribution at a plurality of gray levels (column 9, lines 31-37 of Parker). The filter is circularly symmetric (column 9, lines 35-36 of Parker). As can be seen from figure 1 of Parker, there are small low frequency components before the substantial rise in component values up to frequency f_g, and an absence below a certain frequency value (column 9, lines 7-12 of Parker).

Tajima and Parker are combinable because they are from the same field of endeavor, namely image processing and halftoning. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include noise components with small low frequency components, as taught by Parker, in the halftone threshold matrix taught by Tajima. The motivation for doing so would have been to eliminate disturbing artifacts in the spatial domain (column 9, lines 9-12 of Parker). Therefore, it would have been obvious to combine Parker with Tajima to obtain the invention as specified in claim 17.

19. Claims 49, 59 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Parker (US Patent 5,543,941) and Shimazaki (US Patent 5,832,122).

Regarding claims 49, 59 and 69: Tajima in view of Parker does not disclose expressly said threshold matrix assigns said noise component by introducing weak irregularity (perturbation) or pseudo-periodicity in the dot distribution at said plurality of gray levels.

Shimazaki discloses a dot pattern that has weak irregularity (perturbation) or pseudo-periodicity introduced at a certain gray level (column 5, lines 54-60 of Shimazaki). The

threshold value of 3 is placed at one of two particular positions (figure 6(3A,3B) of Shimazaki) based on the results of a random number (column 5, lines 54-60 of Shimazaki). This would therefore produce the weak irregularity since the threshold arrays are tiled (figure 6 of Shimazaki), but the location of the threshold value of 3 is randomized between two possible locations.

Tajima in view of Parker is combinable with Shimazaki because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to introduce perturbations into the dot pattern using the method taught by Shimazaki. The motivation for doing so would have been to produce a higher quality halftone image, free of a regular pattern (column 6, lines 26-28 of Shimazaki). Therefore, it would have been obvious to combine Shimazaki with Tajima in view of Parker to obtain the invention as specified in claims 49, 59 and 69.

20. Claims 24-26, 28, 31-33, 35, 39-41, 50-51, 60-61 and 70-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Shimazaki (US Patent 5,832,122).

Regarding claims 24, 39 and 50: Tajima discloses an apparatus (figure 2 of Tajima) comprising storage means (figure 2(6M) of Tajima) for storing the threshold matrix (column 5, lines 30-34 of Tajima); comparison means (figure 2(5) of Tajima) for comparing each value of the threshold matrix with density of each pixel of the input image (column 5, lines 14-19 of Tajima); and output means (figure 2(output of 5) of Tajima) for

outputting a binary or multivalue dot pattern (column 5, lines 18-19 of Tajima) based on comparison results of said comparison means (column 5, lines 14-19 of Tajima), wherein said mask is composed by an array of a plurality of element masks (figure 3 (502M) of Tajima), each of which are cyclically arranged (column 5, lines 30-35 of Tajima), and thus of the same size (figure 3 of Tajima).

Tajima does not disclose expressly the size of each element of the array of masks has the same size as that of a mask used in a dispersed-dot dithering method; and that the threshold matrix (mask) generates a dot pattern: (1) having at least a set of element pixel blocks, each of which corresponds to each element mask and having the same dot distribution at each respective gray level; (2) having weak irregularity (perturbation) or pseudo-periodicity introduced at a certain gray level; (3) having an equal number of dots in every element pixel block at each respective gray level; and (4) having an equal number of dots in four individual partial element pixel blocks each having a quarter (1/4) size of an element pixel block at each respective (4n)th (n indicates a positive integer) gray level.

Shimazaki discloses a plurality of element masks (figure 12 and column 3, lines 50-52 of Shimazaki) wherein the size of each element of the array of masks has the same size as that of a mask used in a dispersed-dot dithering method (column 7, lines 22-29 of Shimazaki). A weighting function utilizing a visual point spread function (figure 10 of Shimazaki) is used to create a density distribution for the threshold arrays (column 7, lines 22-25 of Shimazaki) which then creates an overall density distribution (figure 12 and column 7, lines 25-29 of Shimazaki).

Since a visual point spread function is used to create the density distribution (column 7, lines 22-25 of Shimazaki), the dithering (halftoning) method is therefore a dispersed-dot dithering method.

Shimazaki further discloses that said threshold matrix generates a dot pattern having at least a set of element pixel blocks (column 4, lines 46-49 of Shimazaki), each of which corresponds to each element mask and having the same dot distribution at each respective gray level (figures 5-7 and column 4, lines 46-53 of Shimazaki).

Said dot pattern has weak irregularity (perturbation) or pseudo-periodicity introduced at a certain gray level (column 5, lines 54-60 of Shimazaki). The threshold value of 3 is placed at one of two particular positions (figure 6(3A,3B) of Shimazaki) based on the results of a random number (column 5, lines 54-60 of Shimazaki). This would therefore produce the weak irregularity since the threshold arrays are tiled (figure 6 of Shimazaki), but the location of the threshold value of 3 is randomized between two possible locations.

Said dot pattern has an equal number of dots in every element pixel block at each respective gray level (column 4, lines 46-52 of Shimazaki). In the example given in figures 5-7 of Shimazaki, there are 25 pixel points which define 25 threshold values (column 4, lines 49-50 of Shimazaki) which define each element pixel block (threshold array) in the same way (column 4, lines 46-52 of Shimazaki). Therefore, for each gray level, which inherently corresponds with each threshold value, there are an equal number of dots in every element pixel block.

The threshold matrices are designed such that thresholds having close values are not positioned closely to each other, thus preventing undue localization (figures 5-7 and column 6, lines 18-21 of Shimazaki). Preventing such undue localization would therefore require, in a (4n)x(4n) pixel block (n is an integer), that said dot pattern has an equal number of dots in four individual partial element pixel blocks each having a quarter size of an element pixel block at each respective (4n)th (n indicates a positive integer) gray level, since otherwise there would be two threshold values that are close to each other in the same partial element pixel block. Placing said two threshold values so close to each other would create undue localization and would therefore be too close and create a higher level of granularity (column 6, lines 18-23 of Shimazaki).

Tajima and Shimazaki are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the method of creating a threshold matrix as taught by Shimazaki to the creation of the threshold matrices taught by Tajima. The motivation for doing so would have been to produce a higher quality halftone image, free of a regular pattern (column 6, lines 26-28 of Shimazaki). Therefore, it would have been obvious to combine Shimazaki with Tajima to obtain the invention as specified in claims 24, 39 and 50.

Further regarding claim 24: The apparatus of claim 50 performs the method of claim 24.

Further regarding claim 39: Tajima discloses that said threshold matrix (mask) is stored in the memory of said

apparatus (column 5, lines 23-30 of Tajima) and is therefore composed by said apparatus. The apparatus of claim 39 is embodied in the apparatus of claim 50.

Regarding claim 60: The threshold matrix of claim 60 is embodied in the apparatus of claim 50, the arguments of which are incorporated herein.

Regarding claim 70: Tajima discloses an apparatus (figure 2 of Tajima) comprising a module for comparing (figure 2(5) of Tajima) each value of the threshold matrix with the density of each pixel of the input image (column 5, lines 14-18 of Tajima), and for controlling an output of each binary or multivalue dot pattern depending on the comparison results (column 5, lines 18-19 of Tajima), wherein the threshold matrix which produces a dot pattern, as disclosed in claim 60, the arguments of which are incorporated herein. Digital memory (figure 2(3M,3C,3Y,6M,6C, 6Y) of Tajima) and a digital control circuit (figure 2(4) of Tajima) controls the digital image data processing (column 4, lines 61-64 and column 5, lines 10-19 of Tajima). The apparatus is therefore a form of computer. Since digital data is compared with threshold values (column 5, lines 14-19 of Tajima) and various digital processing is performed (column 6, lines 10-26 of Tajima), some form of software is required.

Further regarding claims 25, 40, 51, 61 and 71: Shimazaki further discloses that said weak irregularity (perturbation) or pseudo-periodicity is introduced at a certain gray level equal to of higher than a first gray level (column 5, lines 54-57 of Shimazaki). The threshold value of 3 is higher than a first gray level of 1 (figure 6 and column 4, lines 55-61 of Shimazaki).

Regarding claims 26 and 41: Tajima discloses that the size of said mask (figure 3(502M) of Tajima) is smaller than a size corresponding to a standard size pixel block (defined as 256x256 pixels), which can clearly be seen in figure 3 of Tajima since said mask is no larger than 6 pixels in either the horizontal or vertical directions. The mask is repeatedly arranged two-dimensionally and regularly corresponding to the entire input image (figure 3 and column 5, lines 54-58 of Tajima).

Regarding claim 28: Tajima discloses that said dot pattern generated in the output image has no moiré and/or certain repetitive pattern, when the input image undergoes said gray level reproducing process (column 9,lines 48-54 of Tajima) and the produced image is output by an output device (column 10, lines 5-8 of Tajima).

Regarding claim 31: Tajima discloses that adjacent masks (figure 3(502M) of Tajima) are shifted along boundaries when said mask is repeatedly used and arranged two-dimensionally (figure 3 and column 5, lines 51-58 of Tajima).

Regarding claim 32: Tajima discloses a mask (halftone screen) (figure 3(502M) and column 8, lines 38-42 of Tajima) which is clearly not a quadrilateral.

Regarding claim 33: Tajima does not disclose expressly that said weak irregularity (perturbation) or pseudo-periodicity is implemented by providing small pixel blocks, each having a number of pixels equal to or smaller than a quarter (1/4) of the total number of pixels in an element pixel block, at predetermined positions in all or a part of the individual element pixel blocks, each corresponding to each element mask, and by selecting one pixel for a dot in each of said small pixel blocks.

Shimazaki discloses that said weak irregularity (perturbation) or pseudo-periodicity is implemented by providing small pixel blocks (figure 6(2x2 pixel square enclosing 3A,3B) of Shimazaki), each having a number of pixels equal to or smaller than a quarter (1/4) of the total number of pixels in an element pixel block (column 5, lines 41-46 of Shimazaki). 3A and 3B in figure 6 of Shimazaki are at an equal distance from previously established pixel points (column 5, lines 41-46 of Shimazaki). The 2x2 pixel square area surrounding them can be considered the small pixel block. Since the points, such as 3A and 3B, which are randomly selected for threshold setting (column 5, lines 54-60 of Shimazaki) are the pixels that are at an equal distance from previously established pixel points (column 5, lines 41-46 of Shimazaki), then the number of pixels for said small pixel block must be smaller than a quarter (1/4) of the total number of pixels in an element block. A section that is a quarter (1/4) of the total number of pixels in an element block would have pixels of varying distances from previously established pixels. Only comparatively few pixels could have the same said distance.

Tajima and Shimazaki are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use small regions comprising pixels that are at an equal distance from previously established pixel points to produce said weak irregularity (perturbation) or pseudo-periodicity, as taught by Shimazaki. The motivation for doing so would have been to produce a higher quality halftone image, free of a regular pattern (column 6, lines 26-28 of Shimazaki). Therefore, it would have been

obvious to combine Shimazaki with Tajima to obtain the invention as specified in claim 33.

Regarding claim 35: Tajima discloses that the input image is a color image that is separated into a plurality of color components (column 4, lines 64-67 of Tajima); and at least one of the color components of the color image is used as the input image (column 5, lines 10-14 of Tajima).

21. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Shimazaki (US Patent 5,832,122) and Barton (US Patent 5,526,438).

Regarding claim 34: Tajima in view of Shimazaki does not disclose expressly that, as a process of determining a dot distribution at each respective gray level for producing said mask, a repulsive potential is assigned to all dots constructing a determined dot pattern of a specific gray level and a new dot to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential within the sum of said repulsive potentials.

Barton discloses a repulsive potential (FnC) that is assigned to all dots constructing a determined dot pattern of a specific gray level (column 8, lines 45-51 of Barton) and a new dot to determine a dot distribution for a next gray level is placed at a position having the lowest repulsive potential within the sum of said repulsive potentials (column 8, lines 50-55 of Barton). For a new dot about to be placed, a cost function (FnC) is determined (column 8, lines 45-51 of Barton). Said cost function is a function of radial distance (column 8, lines 48-50 and lines 64-66 of Barton) relating candidate pixels

to other dots (column 8, lines 51-54 of Barton), so said cost function is a potential function.

Tajima in view of Shimazaki is combinable with Barton because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the repulsive potential formulation of Barton to determine the dot locations for the threshold masks. The motivation for doing so would have been to maximize dispersion and minimize visual artifacts (column 2, lines 50-53 of Barton). Therefore, it would have been obvious to combine Barton with Tajima in view of Shimazaki to obtain the invention as specified in claim 34.

22. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima (US Patent 5,572,600) in view of Shimazaki (US Patent 5,832,122) and Rylander (US Patent 5,583,660).

Regarding claim 29: Tajima in view of Shimazaki does not disclose expressly that said output device has a resolution of 600 dpi or greater.

Rylander discloses an output device that has a resolution of 600 dpi or greater (column 12, lines 61-63 of Rylander).

Tajima in view of Shimazaki is combinable with Rylander because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a high resolution output device, as taught by Rylander, to output the image data. The motivation for doing so would have been to output image data produced using a particular fixed

pattern (column 12, lines 57-60 of Rylander). Therefore, it would have been obvious to combine Rylander with Tajima in view of Shimazaki to obtain the invention as specified in claim 29.

Conclusion

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
22 July 2005

THOMAS D.
~~TOMMY~~ LEE
PRIMARY EXAMINER